Making sure subtitles have the colors that you want them to have.

To give subtitles the right color (white face, black edge) there's a few things that you will have to check:

1. Your SST file header
2. The image files containing the subtitles (initially BMP, later converted to TIF)
3. Subtitle settings in composer

Let's go over these. First here's two examples of a SST file header

Byte's header:

st_format   2
Display_Start non_forced
TV_Type   NTSC
Tape_Type   NON_DROP
Pixel_Area   (0 479)
Display_Area   (0 2 719 479)
E2   (0 0 0 ===)
E1   (255 255 255 ===)
PA   (0 0 255 ===)
BG   (255 0 0 ===)
Directory   C:\Users\...

Qro's header:

st_format   2
Display_Start non_forced
TV_Type   NTSC
Tape_Type   NON_DROP
Pixel_Area   (2 479)
Display_Area   (0 2 719 479)
E2   (255 255 255 ===)
E1   (0 0 0 ===)
PA   (0 0 255 ===)
BG   (255 0 0 ===)
Directory   D:\Work\...\Subs..

You see that these headers are nearly identical, the most important difference is the section that has the lines that start with E2, E1, PA, and BG, and these happen to be the most important lines for setting the correct subtitle colors. Let's have a closer look at that section, in Byte's header:

E2   (0 0 0 ===)
E1   (255 255 255 ===)
PA   (0 0 255 ===)
BG   (255 0 0 ===)

These 4 lines basically determine the subtitle colors. They are directly linked to some settings in Composer, which we will see later. Most important to know at this point is that BG specifies the background color. The other three lines specify the actual subtitle colors. 4 colors are currently set here:

The numbers between (and ===) are factually RGB color settings.
The first number sets the RED level, the middle number sets the GREEN level and the third number sets the BLUE level. They can have a value between 0 (lowest possible) and 255 (maximum setting). So basically these lines tell you which color is being set:

E2   (0 0 0 ===)
This sets the color to **black** (no, red, green, or blue)

E1   (255 255 255 ===)
This sets the color to **white** (maximum red, green, and blue)

PA   (0 0 255 ===)
This sets the color to **blue** (no red and green, maximum blue)

BG   (255 0 0 ===)
This sets the color to **red** (maximum red, no green and blue)

Now, let's have a look at an average subtitle image file. When ripping from DVD they might turn out in any given number of ways. Here are a few examples:

1.

   Background: red - Face: white – Edge1: black – Edge2: none

2.

   Background: red – Face: blue – Edge1: white – Edge2: none

3.

   Background: red – Face: black – Edge1: white – Edge2: blue

4.
   Background: red – Face: blue – Edge1: black – Edge2: white

5.
   Background: red – Face: black – Edge1: blue – Edge2: white

It's hard to predict what subtitles will look like after you rip them from a DVD, however in most (99.5%) of all cases the background will be red and the subtitles themselves will be made up with blue and/or black and/or white. This is the reason why the colors in the SST file header are set to red for background, and black, white and blue for the subtitle colors. However there are still 0.5% of all cases where this is different. I've seen white backgrounds and purple subtitles but still have been able to make them show white with a black edge in the encode. I'll give some hints later on how to deal with 'non-standard' subtitles.

We will now go and look how to set the subtitle colors in composer. The ideal subtitles will look like example 1 above. You can make all above samples look like that in the final product by using a simple formula. I'll show you how and will refer to above samples throughout the next section.

In Composer you can set the subtitle color settings here:
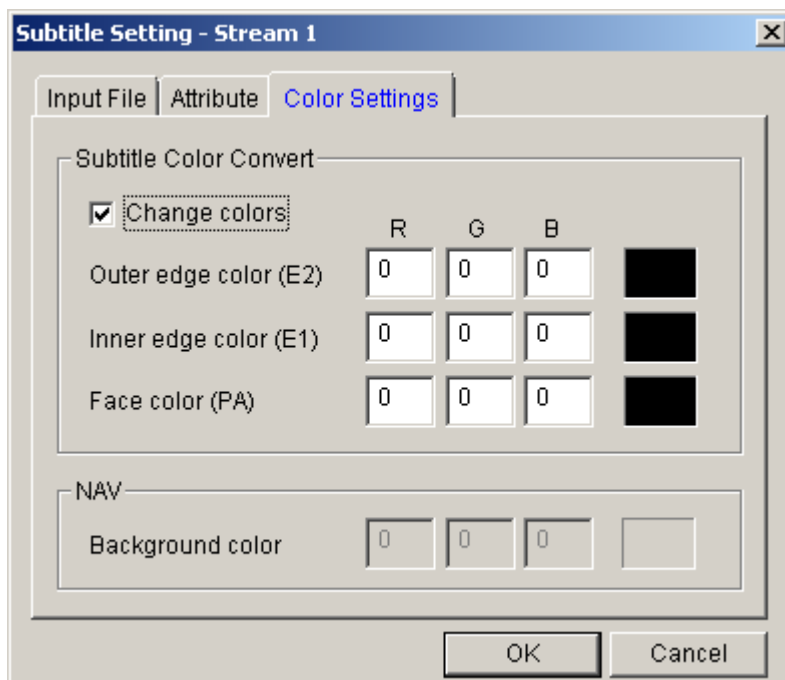
First make sure you select the "Change Colors" checkbox. You can see that only the face (PA) and edge (E1, E2) colors can be set here. The background (BG) color will be lifted directly from the SST file, you cannot change it here.

You can see here very clearly the direct link with the SST file header, it has the same settings: E2, E1, PA and BG with each three fields (RGB) that can be set with values from 0 to 255. Now we have to set these 9 fields in a way that the end-result is the subtitle color that you want it to be. It's an industry standard to have white subtitles with a black edge, so that is what we're going for.

The following might seem a bit complicated at first; however it is the key to setting the correct subtitle colors. Read it a couple of times if you must. You will get the hang of it.

The color order in the SST file header determines the color order in Composer. Let me explain this by taking the example of Bytes header again:

E2	(0 0 0 ===)	- **BLACK** (Outer Edge Color E2 in Composer)
E1	(255 255 255 ===)	- **WHITE** (Inner Edge Color E1 in Composer)
PA	(0 0 255 ===)	- **BLUE** (Face Color PA in Composer)
BG	(255 0 0 ===)	(RED)

However forget about the names that are given in Composer, just remember that in this case (Byte's header) the top line represents Black, the middle line represents White and the third line represents Blue. Now we know this we can have a look at the image file again. Let's look at example 2:

In this example you can see that the background is red, which is correct as our BG setting is RED as well. So no further need to do anything with the background. When we look at the subtitles themselves we see the Face color is blue and the Edge color is white. There is no second Edge color.

We would like the part that is currently blue to become white, and the part that is white to become black. How do we do this? Remember that we said that the lines represent BLACK, WHITE and BLUE, in that order. So to set the blue part in the image file to white, we have to change the BLUE-line to white! We can do this by giving all three fields in that line the value 255 (maximum red, green and blue = white). Equally to make the white edge black we set all fields in the WHITE-line to 0 (no red, green and blue = black). There is no 2nd Edge color, and no black in the image, so the BLACK-line is not used and can be left at all zero. So to turn these subtitles into the correct colors (white face, black edge) we need to set the following in Composer:

So basically you set each line of three fields to the correct values. You look at the image and set the corresponding color-line in Composer to the color it should become. Here Blue becomes White.

Let's do another one:

Here the background is red again, which is fine as our background (BG) color in the SST file header is red. We need to turn the face color from black into white and the edge color from blue into black. Then there's a second edge color, here white.

There are a few things you can do with that second edge color. It depends a bit how it manifests itself in the image. In this example it is very evenly, wrapped completely around the letters, just like the blue edge. So you can choose to turn it into white as well, which will result in a white font with a thin black edge. Or you can turn it into black, which will result in a white font with a thick black edge.

A third option would be to give it another color, lighter than black, darker then white as a sort of crossover between black and white. What I usually do is to set it to a dark grey color. That way it will look like the font has some depth. With other examples, like example 4 above this would be the best thing to do, it will give you the best font as a result.

But let's set this one.

Black needs to become white, so set the BLACK-line to white (255 255 255)
Blue needs to become black, so set the BLUE-line to black (0 0 0)
White needs to become dark grey, so set the WHITE-line to (64 64 64)

So to turn these subtitles into the correct colors (white face, black edge) we need to set the following in Composer:


Simple ehh? ☺

So here are the other 3 examples with the correct values in Composer to get you to the perfect font colors:

Now, when did she

Set to:

	R	G	B	
☑ Change colors				
Outer edge color (E2)	0	0	0	■
Inner edge color (E1)	255	255	255	□
Face color (PA)	0	0	0	■

So I usually run away

Set to:

	R	G	B	
☑ Change colors				
Outer edge color (E2)	255	255	255	□
Inner edge color (E1)	0	0	0	■
Face color (PA)	0	0	0	■

or to:

	R	G	B	
☑ Change colors				
Outer edge color (E2)	255	255	255	□
Inner edge color (E1)	0	0	0	■
Face color (PA)	255	255	255	□

Since this is a small thin font, using grey here does not improve readability.

Safe keep the

Set to:

	R	G	B	
☑ Change colors				
Outer edge color (E2)	0	0	0	■
Inner edge color (E1)	64	64	64	▓
Face color (PA)	255	255	255	□

Above samples all work perfectly when using Byte's header above. When you use a different header, like my header, the order changes. Here is my header:

E2	(255 255 255 ===)	- **WHITE** (Outer Edge Color E2 in Composer)
E1	(0 0 0 ===)	- **BLACK** (Inner Edge Color E1 in Composer)
PA	(0 0 255 ===)	- **BLUE** (Face Color PA in Composer)
BG	(255 0 0 ===)	(RED)

The only thing that changes is the way colors are now represented in Composer. The top-line now represents WHITE, middle-line now represents BLACK, bottom-line now represents BLUE. The principle remains the same however. Check the color in the image and set the representing color line in Composer.

So let me take the first two examples again and show you how they would need to be set in Composer with my header:

Set to:

You see this is the same as with Byte's header, because we both have BLUE in the third line. Only WHITE and BLACK are swapped between my header and Byte's header.


Set to:

You see that the top two lines are swapped compared to Byte's header, and this is exactly what we see in the actual SST file headers as well.

Ok, let me finish off this chapter with a few tips. I always set main movie subtitles to White face and Black edge. If I include a commentary track which has also subtitles, I usually show these subtitles in yellow. This so people know whether they're watching the main movie subtitles or the commentary subtitles. Yellow is the second-most used subtitle color in the movie industry.

To set them to yellow, leave the BLUE-field (B) in the line zero:

When encoding black and white movie, white subtitles tend to get lost in the background occasionally so white subtitles are not the best choice. For black and white movies I usually set the subtitles to a light color yellow, which is enough to have them stand out from a white background:

You can also set that B-value to 192 or 176 to make it even lighter or to 144 or 128 to make it a bit darker.

If you ever come across subtitle images that do not have a red background then don't panic. In most cases the background will be either white, black or blue. I have seen white more often. You can fix this by setting the SST file header accordingly. Say you have a white instead of a red background, then switch the RED and WHITE settings in the SST file header:

E2	(0 0 0 ===)	- **BLACK** (Outer Edge Color E2 in Composer)
E1	(255 0 0 ===)	- **RED** (Inner Edge Color E1 in Composer)
PA	(0 0 255 ===)	- **BLUE** (Face Color PA in Composer)
BG	(255 255 255 ===)	(WHITE)

Make sure that none two of these lines have the same color, switch colors, do not just change the BG color to what you need. Composer needs 4 different colors here, else it will get confused.

After the change the principle remains the same, but instead (in this case) the middle line now represents RED instead of WHITE.